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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,266	02/13/2002	Scott V. Thomsen	3691-367	6813

7590 08/24/2004

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EXAMINER	
ROSSI, JESSICA	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/073,266	THOMSEN ET AL.
	Examiner	Art Unit
	Jessica L. Rossi	1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/12/04, Amendment*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This action is in response to the amendment dated 3/12/04. Claims 7 and 16 were cancelled. Claims 1-6 and 8-15 are pending. Claim 3 is withdrawn from further consideration (see paragraph 2 below).

2. Applicant's election of Species A in the reply filed on 3/12/04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-2, 4-6, 8-10, and 13-15 **stand** rejected under 35 U.S.C. 103(a) as being unpatentable over Medwick et al. (US 2002/0176988; of record) in view of Veerasamy (WO 00/66506; of record), as set forth in paragraph 8 of the previous office action dated 12/12/03.

**It is noted the present invention is directed to providing a protective layer, such as diamond-like carbon (DLC), over a solar coating that is applied to a glass substrate. The DLC layer protects the coating from scratches during shipping/transporting/handling of the substrate. The DLC coating is removed from the substrate during a heating step, which takes place before the substrate is assembled with another substrate to form an article, such as an IG window. (p. 1, [0001]; p. 7, [0028])*

With respect to claim 1, Medwick is directed to a method of making a window unit (p. 7, [0054]) wherein a temporary protective layer is placed over a solar coating on a glass substrate to

protect the coating from *scratches during shipping/handling* of the substrate (abstract; p. 1, [0002] and [0005]).

The reference teaches providing a solar control coating 14 comprising Ag (p. 2, [0011], p. 3, [0024-0026]) on a glass substrate 12 (p. 3, [0023]), depositing at least one temporary **protective layer 16 comprising carbon directly onto the coating 14** (Figure 2; p. 7, [0055]), and heat treating the substrate with the coating and protective layer thereon at a temperature of at least 570°C so that the protective layer burns off (p. 7, [0053]; p. 8, [0057]). The reference teaches incorporating the glass substrate into an IG (insulating glass) unit after this heating step (p. 7, [0054]), wherein the skilled artisan would have appreciated that coupling of the glass substrate of Medwick to another substrate would have to take place in order to form the IG unit, since IG window units comprise at least two glass panes coupled to each other via a spacer(s) with their interior space evacuated and/or filled with a gas (note p. 1-2, [0003], of present specification).

The reference is silent as to the carbon in the protective layer being diamond-like-carbon (DLC) and using a gas comprising a hydrocarbon to ion beam deposit the DLC.

It is known in the art to provide a DLC layer 3 over a solar coating (not shown) on a glass substrate 1, wherein the DLC layer *protects the coating and substrate from scratches* during *shipping/handling*, as taught by Veerasamy (p. 10, lines 16-21; p. 18, lines 10-18; p. 21, line 5). Veerasamy also teaches using the DLC coating to repel dirt and make the coated glass substrate less susceptible to visible corrosion on its surfaces, once the substrate has been heated and then assembled with another substrate to form an article, such as an IG window unit (p. 18, lines 10-18; p. 37, lines 11-15).

Veerasamy acknowledges that the DLC layer is capable of being burned off during this heating step (p. 37, lines 16-20), and therefore provides a temporary non-porous tungsten disulfide layer over the DLC layer to prevent the same from burning off (p. 38, line 1) in order to achieve the additional benefits of repelling dirt and preventing corrosion once the coated glass substrate has been incorporated into a window unit.

One reading Veerasamy as a whole would have appreciated that the only reason for preventing burn-off the DLC layer is to achieve the **additional benefits** of repelling dirt and decreased susceptibility to corrosion, once the coated substrate has been incorporated into a window unit – something **Medwick is NOT concerned with** (note Medwick only concerned with preventing damage to functional coating during shipping/handling of coated glass substrate and therefore teaches removing carbon coating during heating step, which takes place before incorporating the substrate into window unit).

Therefore, the skilled artisan at the time the invention was made would have been motivated to use DLC for the carbon protective layer of Medwick solely for achieving scratch prevention during shipping/handling, as desired by Medwick, because such a carbon layer is known in the art for protecting a coated glass substrate from scratching during shipping/handling, as taught by Veerasamy, wherein such a layer would provide the temporary protection during shipping/handling as desired by Medwick while also allowing for its removal during the heating step, as desired by Medwick.

As for a method of depositing the DLC layer, Medwick teaches that any conventional technique can be used (p. 7, [0055], lines 14-18). Therefore, it would have been obvious to deposit the DLC protective layer using **ion beam deposition using a hydrocarbon gas** because

such is know in the art, as taught by Veerasamy (p. 27, lines 8-12; p. 31, lines 20-22), where this is an effective way to deposit such a layer.

Regarding claim 2, Medwick teaches an IG window unit (p. 7, [0054]).

Regarding claim 4, Medwick teaches heating to at least 570°C (p. 7, [0053]; p. 8, [0057]).

Regarding claim 5, Medwick teaches heating the glass substrate from about 648-704°C to thermally temper the same (p. 7, [0053], p. 8, [0057]). As for the remaining portions of Applicant's claimed range, such would have been obvious to the skilled artisan at the time the invention was made given the closeness of these remaining portions to that taught by Medwick wherein only the expected results would have been achieved. As for a specific heating time, such would have been within purview of the skilled artisan at the time the invention was made depending on the materials used; it being noted that Medwick in view of Veerasamy and the present invention both teach heating a glass substrate having a solar coating and DLC layer thereon at similar temperatures to temper the same.

Regarding claim 6, Medwick teaches burning off the protective coating entirely (p. 7, [0053], p. 8, [0054]).

Regarding claims 8-9, Veerasamy teaches the DLC having an average hardness of at least 30 GPa (p. 22, lines 9-15).

Regarding claim 10, Veerasamy teaches the DLC including more sp3 carbon-carbon bonds than sp2 (p. 7, lines 6-16).

Regarding claim 13, it is noted all these limitations were addressed above with respect to claims 1 and 4.

Regarding claim 14, this limitation was addressed above with respect to claim 2.

Regarding claim 15, Medwick teaches the solar control coating 14 comprising at least one Ag layer and at least first and second dielectric layers on opposite sides of the Ag layer (p. 3, [0026] – p. 4, [0026]).

5. Claims 11-12 **stand** rejected under 35 U.S.C. 103(a) as being unpatentable over Medwick et al. and Veerasamy as applied to claim 1 above, and further in view of Arbab et al. (US 5821001; of record), as set forth in paragraph 9 of the previous office action.

Regarding claim 11, Medwick teaches the solar coating comprising multiple reflective layers and multiple dielectric layers (p. 3, [0026]) but is silent as to a second Ag layer spaced from the first Ag layer with at least one dielectric layer between them. It would have been obvious to use such a construction for the solar coating of Medwick because such is known in the art, as taught by Arbab (column 6, lines 54-56; column 8, line 46 – column 9, line 5; column 10, lines 52-53; column 13, lines 39-46), wherein such a "double-stack" solar coating imparts desirable insulating properties to the window unit.

Regarding claim 12, Medwick teaches the dielectric layers being metal oxides (p. 3, [0026]) but is silent as to a specific metal oxide. It would have been obvious to the skilled artisan at the time the invention was made to use tin oxide because such is known in the art, as taught by Arbab (p. 13, lines 43-46), wherein such a dielectric layer works well with an Ag reflective layer (note Arbab teaches Ag reflective layer between tin oxide layers; p. 13, lines 43-46).

Response to Arguments

6. Applicant's arguments filed 3/12/04 have been fully considered but they are not persuasive.

7. On pages 6-7 of the arguments, Applicant argues that Medwick teaches depositing the carbon protective coating 16 by MSVD or carbon arc deposition, which are both entirely unrelated to ion beam deposition as called for in present claim 1. Applicant also argues that because of these deposition techniques Medwick teaches that a blocking layer 18 must be provided under the carbon to prevent damage to the functional coating 14.

First, the examiner points out that the MSVD and carbon arc deposition techniques discussed by Medwick are merely illustrative and by no means limiting. In fact, Medwick specifically states that the carbon coating "can be deposited over the substrate 12 and/or optional functional coating 14 in any conventional manner, such as but not to be considered as limiting, by MSVD or carbon arc deposition" (p. 7, [0055], lines 14-18).

Second, Medwick teaches that a blocking layer 18 **may** be present between the functional layer 14 and carbon coating 16 but the reference clearly states that this blocking layer is only **preferable** and not required (p. 7, [0056]); it being noted that Figure 2 shows the carbon coating 16 being in **direct contact** with the functional layer 14.

Third, the reference says nothing about the presence of a blocking layer 18 between the functional layer 14 and carbon coating 16 having to do with the type of technique used to deposit the carbon coating. Furthermore, Veerasamy teaches it being known in the art to deposit a DLC coating using ion beam deposition, which uses a hydrocarbon inclusive gas (p. 27, lines 8-12; p. 31, lines 20-22), as set forth in paragraph 4 above.

8. On page 7 of the arguments, Applicant argues that Medwick fails to teach ion beam deposition, use of hydrocarbon gas in ion beam deposition, and use of DLC in the protective layer.

The examiner agrees that Medwick fails to teach these limitations. However, Veerasamy teaches ion beam depositing a DLC layer onto a functional coating, where hydrocarbon gas is used in the ion beam and the DLC layer serves to protect the functional coating from scratching during shipping/handling (see paragraph 4 above). Therefore, Veerasamy provides ample motivation to modify the teachings of Medwick to thereby render the presently claimed invention obvious, as set forth in paragraph 4 above.

9. On pages 7-8, Applicant argues that Veerasamy teaches away from the invention of claim 1 because the goal of the reference is to prevent the DLC from burning off by using a tungsten layer on top of the DLC layer. Therefore, Applicant argues that the skilled artisan would not combine the teachings of Medwick and Veerasamy.

As clearly set forth in paragraph 4 above, Veerasamy teaches the DLC layer protecting the functional coating from scratching during shipping/handling. Veerasamy also acknowledges that the DLC layer is capable of being removed during heating of the glass substrate and the only reason the reference prevents this from happening is to achieve the additional benefits of repelling dirt and preventing corrosion once the coated glass substrate is incorporated into a window unit.

On the other hand, Medwick is not concerned with protecting the functional coating once shipping/handling is done and therefore teaches removing the protective carbon coating during the heating step, which takes place before the substrate is incorporated into a window unit. Furthermore, Medwick is not concerned with repelling dirt and preventing corrosion – the only reason Veerasamy prevents the DLC from burning off during the heating step.

Since Medwick is **only** concerned with using the carbon coating to protect the coated glass substrate during shipping/handling thereof, which takes place before heating the coated glass substrate and then incorporating the same into a window unit, the skilled artisan would have been motivated to use DLC for the carbon protective layer of Medwick because such a layer would provide temporary protection during shipping/handling as desired by Medwick while also allowing for its removal during the heating step, as desired by Medwick.

10. On page 7 of the arguments, Applicant argues that ion beam depositing a DLC layer using a hydrocarbon inclusive gas leads to unexpected results.

First, the examiner would like to point out that Veerasamy teaches depositing a DLC layer using a hydrocarbon inclusive gas (see paragraph 4 above). Furthermore, one skilled in the art would have been motivated to ion beam deposit a DLC protective layer onto the functional coating of Medwick using a hydrocarbon inclusive gas in light of the teachings of Veerasamy, as set forth in paragraph 4 above. Second, Applicant's assertions of unexpected results constitute mere argument (see MPEP § 716.01(c)).

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jessica L. Rossi** whose telephone number is **571-272-1223**. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine R. Copenheaver can be reached on 571-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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